

**SANYO**

No.2021A

**2SB1166/2SD1723**

PNP/NPN Epitaxial Planar Silicon Transistors

**50V/8A Switching Applications****Applications**

- Relay drivers, high-speed inverters, converters

**Features**

- Low collector-to-emitter saturation voltage
- High  $f_T$
- Excellent linearity of  $h_{FE}$
- Fast switching time

( ): 2SB1166

**Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$** 

			unit
Collector-to-Base Voltage	$V_{CBO}$	(-)60	V
Collector-to-Emitter Voltage	$V_{CEO}$	(-)50	V
Emitter-to-Base Voltage	$V_{EBO}$	(-)6	V
Collector Current	$I_C$	(-)8	A
Collector Current (Pulse)	$I_{CP}$	(-)12	A
Collector Dissipation	$P_C$	1.2	W
		20	W
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

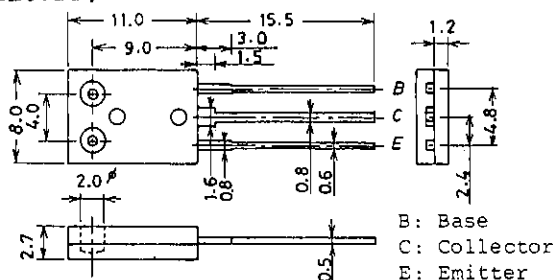
 $T_c=25^\circ\text{C}$ **Electrical Characteristics at  $T_a=25^\circ\text{C}$** 

			min	typ	max	unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)40\text{V}, I_E=0$			(-)1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-)1	$\mu\text{A}$
DC Current Gain	$h_{FE}(1)$	$V_{CE}=(-)2\text{V}, I_C=(-)0.5\text{A}$	70*		400*	
	$h_{FE}(2)$	$V_{CE}=(-)2\text{V}, I_C=(-)6\text{A}$	35			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)5\text{V}, I_C=(-)1\text{A}$		180		MHz
				(130)		MHz
Output Capacitance	$c_{ob}$	$V_{CB}=(-)10\text{V}, f=1\text{MHz}$		65		pF
				(95)		pF
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)4\text{A}, I_B=(-)0.2\text{A}$		200	400	mV
				(-250)	(-500)	mV

Continued on next page.

\*: The 2SB1166/2SD1723 are classified by 0.5A  $h_{FE}$  as follows:

70	Q	140	100	R	200	140	S	280	200	T	400
----	---	-----	-----	---	-----	-----	---	-----	-----	---	-----

**Package Dimensions 2043A  
(unit:mm)**

SANYO: TO126LP

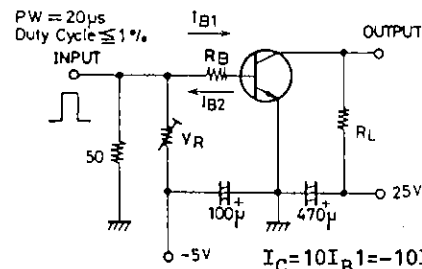
**SANYO Electric Co., Ltd. Semiconductor Business Headquarters**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

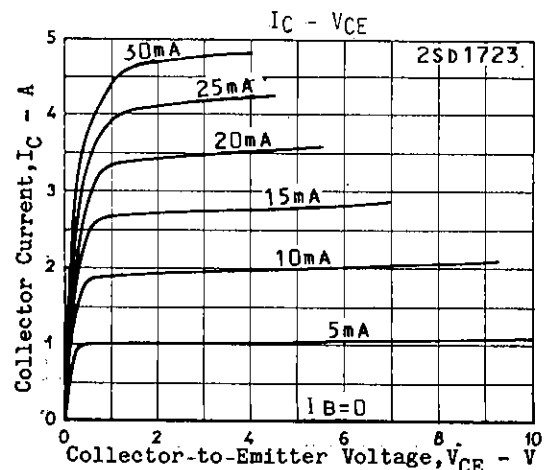
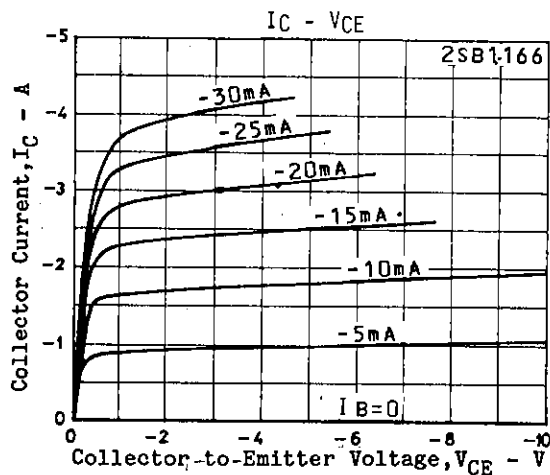
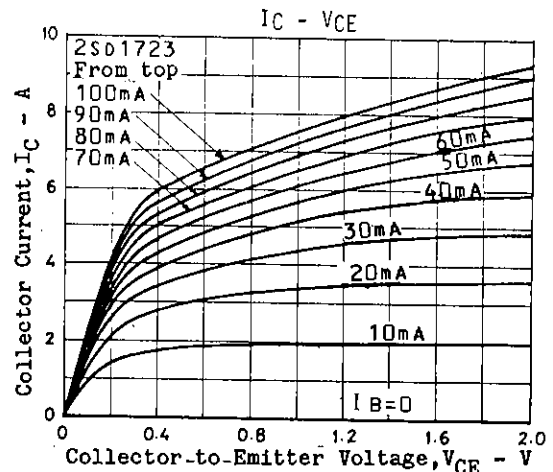
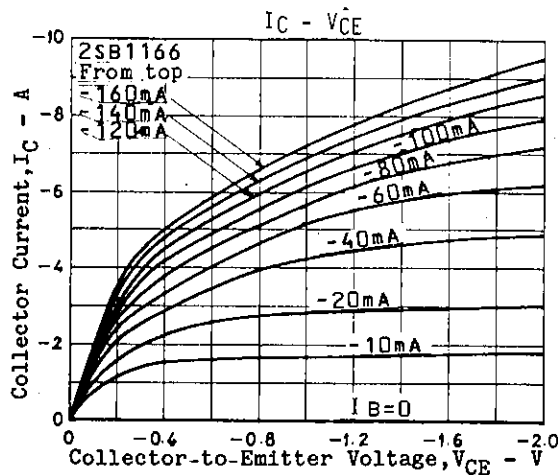
Continued from preceding page.

			min	typ	max	unit
B-E Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)4A, I_B=(-)0.2A$		(-)0.95	(-)1.3	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$		(-)60		V
C-E Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$		(-)50		V
E-B Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0$		(-)6		V
Turn-on Time	$t_{on}$	See specified Test Circuit.		50		ns
				(50)		ns
Storage Time	$t_{stg}$	"		500		ns
				(450)		ns
Fall Time	$t_f$	"		20		ns
				(20)		ns

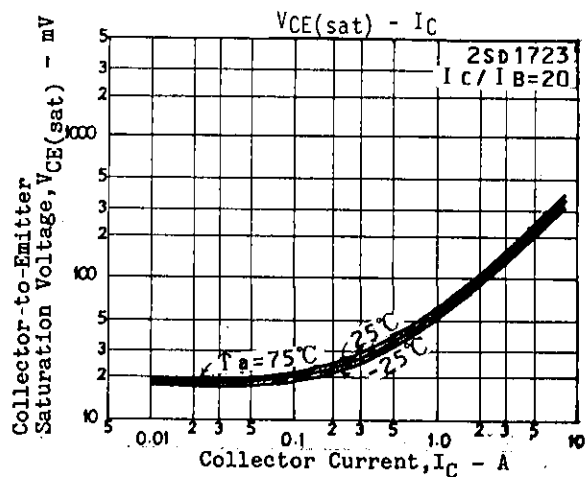
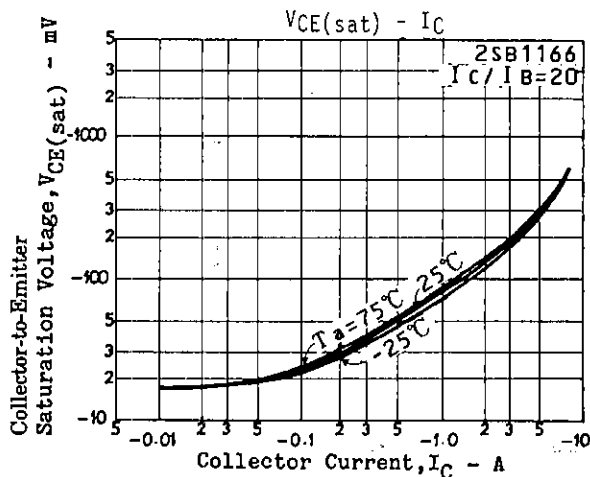
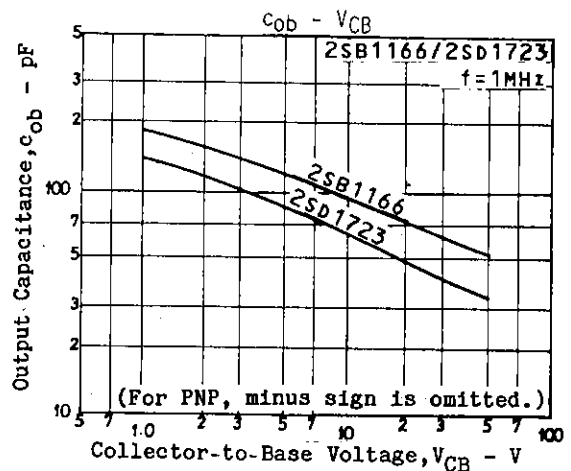
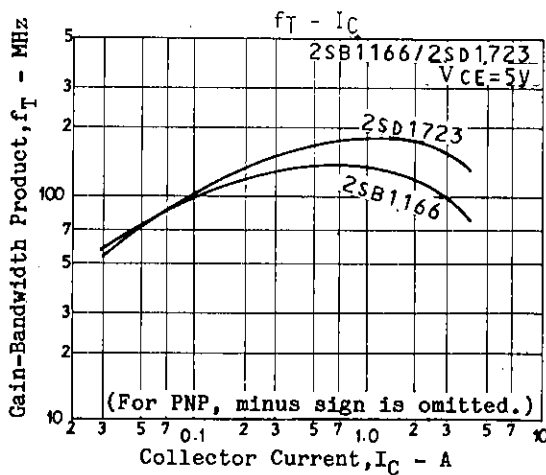
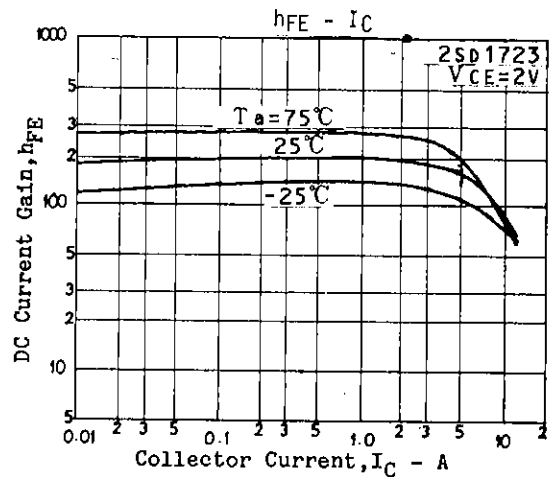
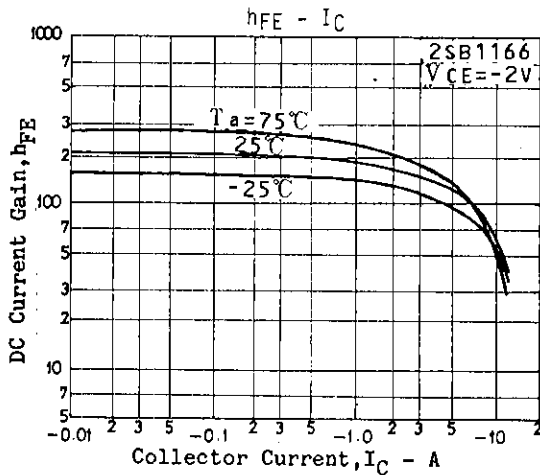
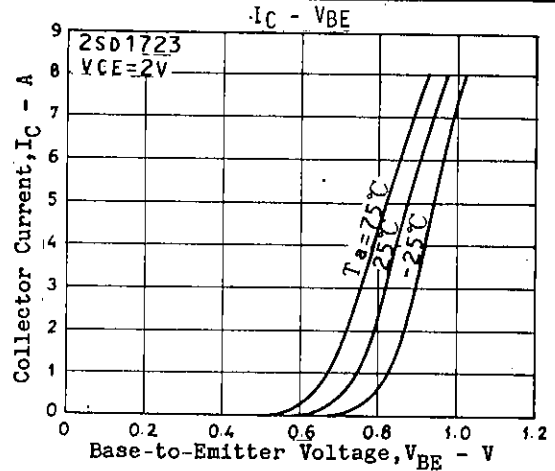
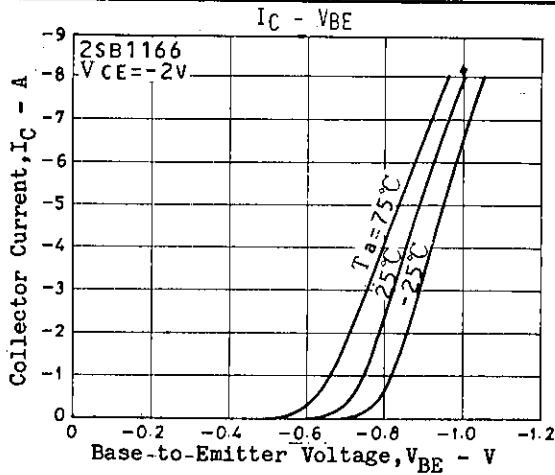
## Switching Time Test Circuit

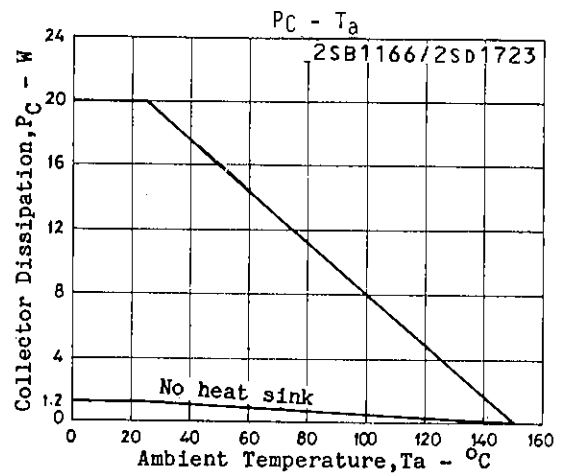
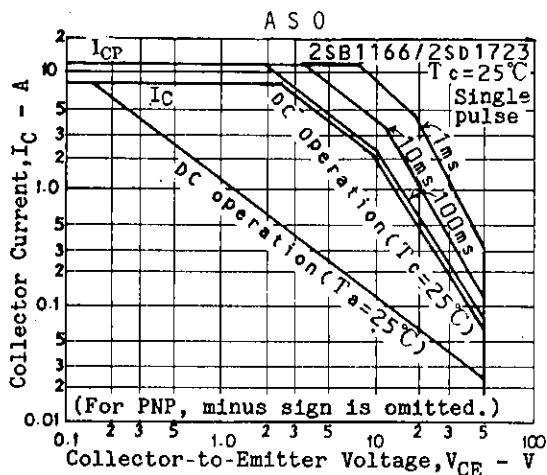
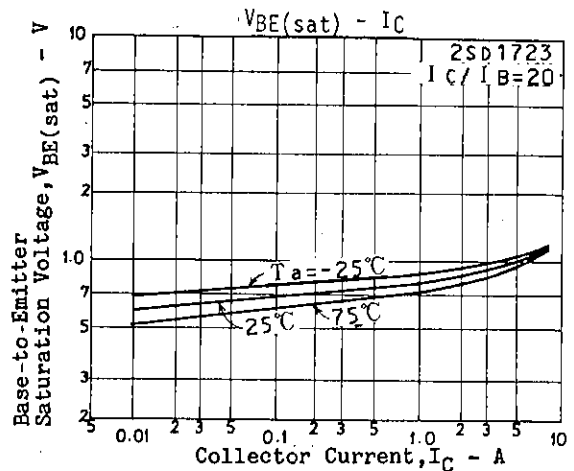
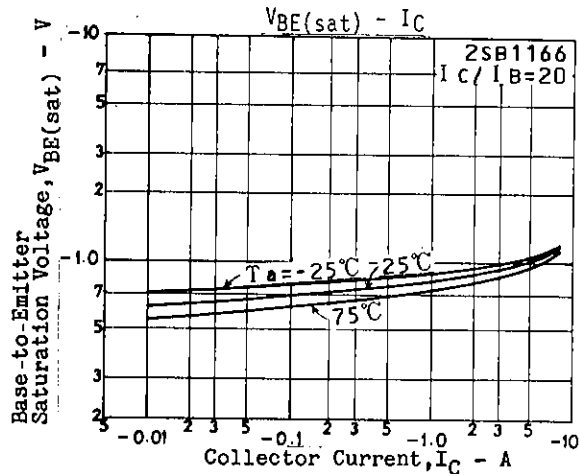
Unit (Resistance:  $\Omega$ , Capacitance: F)

For PNP, the polarity is reversed.



# 2SB1166/2SD1723





- No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.
- Anyone purchasing any products described or contained herein for an above-mentioned use shall:
  - ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use;
  - ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.